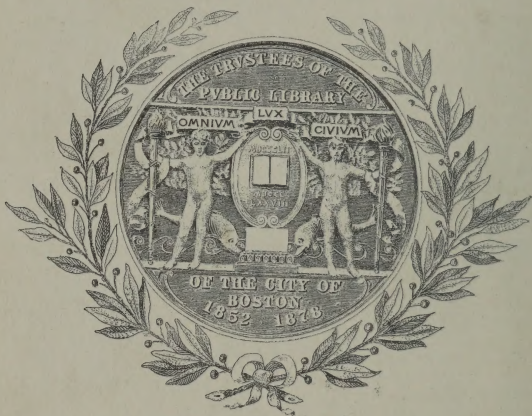


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GIVEN BY

Anonymous

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VIBRATION OR 4046.446 SOUND INDUCED VOICE

By
Graham S. McArthur

NEW SYSTEM
OF THE
A new System of Voice Production
by Vibration or Induction

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FOREWORD



By the Vibration or Sound Induced Voice is meant a system having two or more persons in it, one silently reading printed matter, while the other or others, silently or aloud, at a distance, read the same printed matter, although out of sight of both printed matter and person number one and without any apparent sound electrical communication between the two parties.

This system follows the voice principle in that distant sound controls the mouth through the closed lips and nose instead of from the larynx. In the Vibration or Sound Induced Voice System the lips of number one are closed to a natural closed position and his mouth is so sound-tuned by training and by the influence of voice of number two, so close to the threshold of audibility or feeling that he can not be heard except when number two speaks, with number two's mouth acting like a resonator and number one's voice being the resonant sound. The mouth of number one is trained to a habit of response by keeping time to distant, outside, periodic sound with his closed mouth act until this habit forms.

The writer discovered this method by accident and found that it came from practice and following the method outlined within this pamphlet. This requires some practice, but the reader will become edified at what his voice can be made to do.

The War and Navy Departments and War College during the late war examined this method and declared themselves to be greatly interested in its development, and it is expected that by the use of a proper training system this method can become as whistling. It is within the bounds of possibility that number two can cause responsivity in number one. That device like an echo altimeter can be made which will cause a response from number one without his being aware of it. It may be that on electrified condition between the two causes communication.

Anonymous
Dec. 31, 1931

VIBRATION INDUCED VOICE

by

GRAHAM S. McARTHUR

In publishing this pamphlet the writer wishes to describe and discuss, as well as instruct in part, a certain form of vocal act on which he has not been able to find anything published, either in this country or Europe, having read everything that could be found of a similar nature, so that this may be a new discovery or idea.

Books by the dozen have been published on ventriloquism or voice throwing, lip-reading and different phases of kindred subjects, but nothing quite following this line.

The form of vocal act to be discussed is the art or act of causing a silent (or rather, without any apparent vocal sound) vocal communication between two or more persons.

The business of number one is to cause, or be the source of the quality or almost silent partial tone or tones at the threshold of audibility or feeling which are one of the causes of communication. Number two is to be the source of and user of fundamental, or masked, or induced tones of voice. A combination of these tones will be formed in the mouth of number two.

In performing this act there are no signals nor signs nor any understanding as to what is to be communicated between the two parties other than the training in the use of this system of voice.

The plan in performing this act is to use only printed matter such as books, newspapers, magazines, typewritten letters, etc., in fact, anything that is readable in any language that the performers may care to use. All printed matter is to be selected by a committee from the audience who are known to the audience and whom the audience know to have had nothing to do previously with the persons performing the act or their agents or managers.

After the persons performing the voicing method act have made their demonstration, members of the committee from the audience can hand over the printed matter to the audience, as it is read, for their inspection.

The agent and his partner should be placed on the stage, or the place where the demonstration is to be made, so they will be in full sight of the

audience. The agent can sit reading the printed matter while the percipient or percipients should stand before the audience and do their part by speaking in a clear voice and telling what the agent is reading in the selected book or other printed matter.

This looks like a hard act to perform, yet it has been done and can be performed in a physics laboratory as an experiment in synthetic voice, with the use of apparatus. It is a method which requires training and the use of this system, both by the agent and by the percipient or percipients, yet it should be no harder to perform than to talk ventriloquistically, lip read, whistle a tune, play a musical instrument, or sing a song.

As has been said, this method was discovered by accident and not by intention and led on in its way to its own discovery, so I will have to come to the point directly and tell how it was that I came to conceive of such an idea.

About nineteen years ago, when I was a young man working for a farmer in North Dakota, I first came to notice what is to be discussed in this pamphlet. It was during early June in the spring of nineteen ten, and the farmers were finishing their belated sowing of wheat and flax. My working partner and I had several hundred acres of ground to plow. My task was running the large plowing outfit.

As the owner of the place lived in the nearby village, we stayed in the local and only hotel. The village had a population of several hundred, while a number of wheat elevators, a feed store, a number of general stores and a railroad running east and west made up the scenery.

The hotel was one of those small two storied buildings often found in such villages to greet and care for the traveling public. The lower part of the building had an office, bar and poolroom, dining room, kitchen and private rooms. Upstairs there were a couple of dozen guest chambers.

I roomed directly over the office and spent the most of my rather dull evenings there. All I could find to do was to read and listen to what was being said below. There I could hear a motley crew of village drunks, loungers, farmers and their men, business men and traveling men—all meeting, playing cards, getting drunk and passing the time of evening with each other.

This was the thing I noticed. Every time I had my attention on any subject the crowd would report the matter to each other just as it occurred to me. The crowd below changed constantly from evening to evening. I will admit that I was somewhat puzzled by their showing, and did not know what to make of such a performance.

But time passed and I left the vicinity, going to the state of California. Here in the east central mountainous portion of the state I commenced working for the Southern Pacific Railway as a switchman and muck from the further end of an incompleted tunnel which was then being dug through a section of those mountains. My task was to see that the loads of muck were removed from the tunnel to the dump outside, and the cars returned to the center of or end of the tunnel.

This tunnel was being blasted out with the use of powder. All day and all night long the air drills were hammering into the hard surface rock at the further end of the boring. Every now and then the gang would come back to the center of the tunnel and blasts would go off. Then they would return to the further end of the hole.

Here anything I occurred upon was echoed by the air-drills and hammers. I spent considerable of my time sitting on the edge of one of the cars listening to this phenomenon and trying to get it to perform, noting that it had certain characteristics and peculiarities which I will later discuss.

But in the course of time this job also played out and I found another. In a village near San Francisco I noticed the same peculiarity about a pump on a steam engine in the railway yards. This was especially true at night. I could often hear the bar-room loafers and the others below doing the same thing as was done to me in North Dakota.

One Sunday several months later I was staying in another large rooming house. Down the hallway about a hundred feet from my room was a public room containing an organ. As I could hear, upon this occasion, a crowd was gathered about the organ playing the instrument and singing songs. I knew by the movement of the crowd that there was about a dozen people, although I never found out who they were.

I was not expecting what was to happen next, yet I was not altogether surprised, but now I had another and more brilliant experience. In my room was a number of magazines, one of which I picked up and commenced to read. Just as I opened the magazine and took a first look at its pages, the words of their song changed to the words of the magazine I was reading and so on down the page from word to word, from sentence to sentence, and from paragraph to paragraph as my eye followed the lines. The words came clear and plain, and there was no mistaking them while the organ seemed to be echoing an accompaniment.

All that afternoon this went on with my reading and making tests to see if there was any chance of my being the subject of a practical joke, but I found nothing that would prove this.

For a long time after this whenever I read, this performance continued if any of the above mentioned conditions prevailed in the part of the country where I happened to be. But I finally discovered how it could be prevented and how it could be trained.

And thus did I come to discover and get to studying this curious phenomenon of voice, but I did not attempt to discover about such things from books for considerable time after.

I wrote a number of letters to the American Society for Physical Research and also for a number of eastern newspapers and magazines on this phenomenon. For these letters I received due thanks and also a promise that they would shortly be published, but up to now I have seen nothing, although the secretary of the Physical Society told me she was holding my letters for reference. The Society shed little light on the subject as did my constant delving into the mess of rubbish published on such matters.

I found on this reading method one instance somewhat similar to the one which is being described, but not so developed. This instance was of a French lady and her son whose names were given as X. Madam X and young X were the wife and son of a French official, and this phenomenon occurred between them. Although the child was not over six years of age, he could give the most correct answers to difficult problems in mathematics, science and chemistry. However, they discovered one thing about this child: that he could not discover anything except when his mother had her attention on the subject under discussion with the correct solution of the given problems; then he would give the correct answer.

While visiting at the home of the couple, one old gentleman thought of and decided to try an experiment. He obtained a book which he had the mother look at, and while not allowing the child to see certain lines which he wished the child to tell, asked the child what those lines were. The child responded at once and quoted the lines requested. The experiment was repeated quite a number of times with similar results. Yet the French doctor who gave the account failed to tell how this phenomenon occurred.

I have now two more instances observed by myself which are somewhat similar in nature. One of these was of a slate medium. This lady traveled in company with her husband with one of the largest shows in the country. She made some remarkable demonstrations. Her method was to have those for whom she did the guessing write on a slate in their charge anything they wanted her to guess. Then, blindfolded, she would tell them what it was. The other instance I saw at a state fair. In this one the acts were performed by a young couple who were brother and sister. The young lady could tell everything her brother or the spectators would lay hands on. She could do this all day long.

Another one was of a young child in a western city who could tell by telephone anything which her father laid his hands on. This is a more recent instance.

I also witnessed two more instances. These were of blindfolded auto-driving, one of these the famous Thomson Case. He is the most remarkable exhibition of this sort I ever saw, as most people who have seen him perform will say.

Just before the outbreak of the late war I wrote to the War and Navy Departments in regard to this matter, and they replied saying that they were very much interested and gave me a number for correspondence, thus giving credence to my report so I felt somewhat encouraged. A little later I decided to go to Washington, D. C., and see them about it.

So one day in the late autumn of nineteen seventeen I arrived in Washington, D. C., and went to the State, War and Navy Building. Here I showed them my letter and after they had examined the first letter I had forwarded them, I was shown around by a messenger boy who directed me to the Signal Corps Office.

There was about half a dozen committees to see. They could be found in different parts of the city. Most of the heads of the committees were either in Europe or in different parts of the city. One had to go

through several of these committees before he finally saw the man he was sent to see. The city streets were very quiet and although there were quite a number of men in army officer uniforms going about, one would never have expected that a war was going on from the general appearance of things.

The first ones whom I saw at the Signal Corps Department I explained my plan to. They said that I should go to a certain room number on the second floor where plans of the kind referred to in the letter were looked after.

I spent the rest of the autumn and winter working about the city and visiting a number of committees with whom I had several talks on my plan. I was sent to the War College by one of these committees and there I also had a number of talks about this plan. They referred me to specialists on the subjects pertaining to the plan.

I have found that I was better taken care of than I then suspected, as the persons to whom I was sent, as I have found from recent readings, were eminent leaders in physics, music, voice, phonographs and talking machine apparatus, synthetic voice, telephone and telegraph and sound apparatus and how such a phenomenon could be made to exist.

I stayed in Washington for about a year. During that time I spent the most of my spare time at the different libraries reading and going through books of many kinds, trying to make up a correct system which could be followed by anyone and which would cause the same condition and phenomenon to exist.

But the war came to an end, and the troops commenced to return. People lost interest in things military and everything that had to do with such matters.

About nine years later I came across a book by Alexander Graham Bell, inventor of the telephone. This work contains a series of lectures on teaching of speech to the deaf. It teaches of the mechanical functions of the human voice organs and other matters having to do with the voice machine. It contains many charts and systems telling the proper way to place the vocal organs so as to form letters and words and how to make corrections in vocal action.

I next read several works on ventriloquism and vocal illusions. I also read a number of pamphlets on the artificial larynx and how sound introduced into the mouth could be made to form speech sounds. This larynx is used after operations in which the larynx is removed.

I also read a number of books on the physics of music and sound by different writers, these including the works of Helmholtz, Milliken, Capstick, Panerson, Rayleigh, Fletcher, Crandell, Action and a dozen others of note.

Thus I came to understand more how the voice performs and so set out to analyze my vocal act to discover what I had done to train me to perform such an act.

Several distinct and separate previous acts of training were performed by me before I came to perform the last act which was the reading act. I will number them so that we can refer to them in that way as we proceed.

They will be numbered as follows:

(Act 1). The first one was when I was a young child playing a mouth organ or blowing a whistle. I had no musical training at school so did not know how to play according to the scale, but instead I would try to get the instrument to talk. Speech sounds have different characteristics by which each of the vowels and consonants can be told. In this way I trained myself to tell the different characteristics of speech waves.

This trick I learned so well that I never forgot it, and I could make this form of instrument talk. The sound should be so formed that it would seem as if the instrument was talking. I would also hold the instrument at the distance of a few inches and get it to talk also. It is also a good plan to try blowing through the nose to get the instrument to perform. Use the alphabet and numbers to start with and practice until you can get a perfect performance. Get some book and use it as a guide and cause the instrument to speak them in this training performance.

Helmholtz's book "Sensations of Tone" has a number of experiments on vowel quality and synthetic voice which it would be well to read. Also Bell's book "The Mechanism of Speech" has a number of discussions on such matters. Besides there are a number of experimenters in this field whose works can be found in any public library.

(Act 2). The second performance was in breathing to a distant resonator to cause it to perform as in an experiment with a Helmholtz resonator. In the Helmholtz experiments a tuning fork and resonator are used. The resonator will make the sound as much as two hundred times louder, it has been claimed by some experimenters. The mouth has been compared to a Helmholtz resonator. A common bottle can be taken and if one will blow into it, the sound will be made very much louder by this method. This is the gist of the experiment. A physics text will tell better than I could about this. But in this second act the training method is to select small cavities at a distance of fifty or a hundred feet and get them to resonate, so that one can gauge the amount of sound required to cause a loud sound in the distant cavity yet with little sound from the experimenter. I used to select knot holes at different distances and make them speak after a little performance. I had a great fad for doing this sort of thing for the longest time, but one can do it with very little practice. The holes selected can be the size of the mouth cavity when open to speak, and also shaped like the inside of the mouth. The amount of sound used by a larynx is the correct amount to use for the mouth. This can often be so near the threshold of audibility and that of feeling that it would be impossible to tell that there was any sound communication between the experimenter and the resonator. Also the external auditory meatus and the pinna, as well as the nose, can be used as resonators. It is also possible to control the mouth so that it can be made to say almost anything.

Another experimenter, Capstick, told of an experiment in the use of a system of sound reflection. He placed two large spherical mirrors facing each other at a distance of from twenty to fifty feet. Then a watch was placed in the focus of mirror number one. The sound from the mirror was then reflected to the mirror number two and came to a focus at it. This was collected at number two by a rubber tube and was found to have lost none of its strength. It may be possible to use such a law in these experiments as we often find sound conditions, such as the experiment shows can be found, almost anywhere.

(Act 3). One night I was in a room with two other parties. At this particular time I noticed that both parties were asleep and snoring. I was a little wakeful and was thinking of a trip I had just made when suddenly I noticed that both parties, in a gentle whisper formed by the snore, were telling me of the trip just as it occurred. In the Bell work is related the effect of quality or partial tones in the cords forming the letters or words. The addition of these from me to their snore caused the whisper to form in which they told me about the trip. I had many other experiences with those combination tones. Upon one occasion I slept in a barn during threshing time. I noticed at this time that the cattle were performing the same act by breathing, which assured me that the two parties were not joshing me. They formed part of the tone, and I made the addition to form the whisper. Later, upon another occasion, I noticed the crowd were watching a pipe I was smoking. They were using it like an artificial larynx. That is, by talking at the bowl of the pipe, they would form minute sound vibrations which ran down the stem of the pipe and told me altogether different things than they were speaking of openly. More than once they would tell me of what had been said in this way, showing that they knew how to discuss in this way. Often now when smoking my pipe I can put my tongue up to the opening in the stem of my pipe and hear through its end what they are saying by the sensation movements of the tongue. These talks were so natural that one was tempted to believe they came from oneself until tests showed this to be not true.

(Act 4). One of the principal acts in this system of training was that of timing, or keeping time, with my inward or closed mouth vocal act to distant periodic sound, as when one keeps time to music while singing, dancing or marching. The inward vocal act was so timed that the tongue was partly supported by the distant periodic sound so that it required very little effort to do this. It seemed to me that I formed a complete vocal act at the distant sound source by a combination of what my vocal cavity and the distant sound formed there.

I got into this habit by chance and came to be able to do this vocal act with great precision, probably by much performance. To all forms of sound I would perform this vocal act. To the ticking of clocks, watches and telegraph instruments, the singing of telephone wires, the puffing of steam engines, the using of igniters by gasoline engines, the movement of street cars, the noise of air drills and hammers, the pumping of engines, automobiles, music of different sorts, the snoring, breathing or walking of people, and finally the talking of people. The sound seemed to come through between the teeth and out through the nose, and there

was a sort of quivering of the features up to the eyes which one could feel by laying one's fingers on the eyelids. This sound was just at the edge of, or beyond (except when collected by a resonator) the threshold of audibility or feeling. Whether or not my voice sent a complete or partial vocal act I do not know, but there was probably either one or the other of these conditions.

There was a number of sound conditions. One of these was: resonators, like the mouth, nose or ear, can be tuned so that sound can be raised or brought to the auditory sensation area. Some experimenters claim that this can be done up to two hundred times by the mouth when exactly in tune. Helmholtz discovered the resonator which is merely a small vessel used in combination with a tuning fork to study sound amplification. Helmholtz made experiments in synthetic vowels. Rayleigh was another experimenter who studies resonators. Sympathy and reflection of sound are two other sound conditions which should be understood.

In this act it seemed as if the tongue vibrated in parts or segments with the distant sound and at the same time, as though a secondary vocal act came from me to distant sound source to form the vocal sound. It is explained in books on speech organs that each word or letter requires a different inward position of voice organ points.

It has been claimed that under special conditions one can see noise. My theory about this was that the quivering of the face caused the eye or the lids to vibrate, and in this manner varied the amount of light entering the eye.

No one would think that sound would come through in this way from the closed mouth, but a number of physics explain that sound escaping from a small vent is much more vigorous, and it also seemed, to me as though the mouth did the act better when tightly closed than when open. I remember that Bullard, the naval expert, said in his letter that the sound probably passed back and forth several times.

(Act 5). I have read of a certain old time author who would count the number of boards in the sidewalk, the number of lamp posts, etc., as he went along, but I had this beat. I would count the number of sounds I heard all day long, or else repeat the number or letters which come to me the easiest. They were a, b, c, d, u, v, w, x, y, z, and the numbers 7, 3, 4, 8. I would take intervals of time repeating these numbers, all the time trying to get the distant sounds to form these letters and numbers. There was a tendency to use cha, zha, sha and other unvoiced fricative consonants, and for my mouth to form the "that" voice position. These letters and numbers show probably the correct voice position. Much on voice performance will be found in books on such subjects as teaching the deaf to speak, lip reading, singing, ventriloquism, whistling, physics of voice and hearing, and other such studies.

(Act 6). This act is one in which the second man does the work of causing a sound or echo report from number one. He should train by causing sound returns or echoes from distant resonators of different sizes until he is able to distinguish the different sounds by the effect of the echo on his spoken words or other sound systems he may use. One

should practice until one is thoroughly expert. Thus trained, one can get much from the face by the use of sound. As the interior of the mouth changes about, as when one is reading silently or when one reads aloud, the mild sound rule will cause this slight response which may come from number one almost without his knowledge. With an expert it can be done without knowledge of number one. Number two should be a lip reader, although this may not always be necessary, as it will help him to interpret the person he is trying to induce. Imitation of mannerism is said to be a good way to understand one. One should by training, by the use of discussion, induce his man so that any inward vocal change could be interpreted.

In these responses the sound should cross the tongue of number one in a certain way. The sides and front of the mouth should be reached by number two in about the following fashion. There should be vibration periods on the lips, cheeks, temples and neck behind the ears; on the left side of cheek and lip so the sound will effect where the tongue is beside the premolars and front molar and on lower wisdom tooth region and cross the tongue to the other side; on the right side where the sound will effect the tongue, lip and cheek at the first premolar and two front molar regions with sound crossing to the other side. The mouth can be closed in the ordinary fashion, or tight, or even slightly open.

The experimenter may, if he thinks proper, discard these special directions and time, or keep time, until he finds how his mouth performs with the different forms of sound he chooses to use. He will find that his knowledge of the physics of sound and voice has much to do with the apparent silent voice communication, as will his partner, in this form of voice.

Number two can practice talking from resonators by echo until he can cause responses from people. In this way he can tell almost anything that their mouth or voice organs are formed to position on.

It may be that the vibrations of electrified metal caused on electrified condition between the two so that the communication was caused in this way. This idea I wrote to the government on in 1916, and in letter to the American Society for Physical Research

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